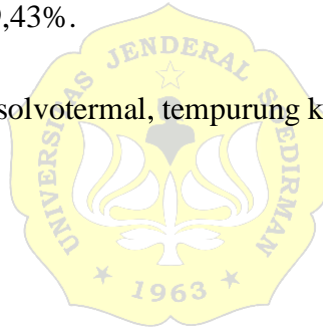


ABSTRAK

Material *reduced graphene oxide* (rGO) menjadi material yang menarik dikembangkan karena potensinya diberbagai teknologi. Penelitian ini bertujuan membuat material *reduced graphene oxide* (rGO) berbasis biomassa tempurung kelapa menggunakan metode aktivasi kimia-fisika menggunakan kalium hidroksida (KOH) 90% dengan pemanasan pada suhu 700 °C selama 2 jam dan modifikasi metode solvotermal dengan variasi konsentrasi dispersi 0, 1, 3, dan 5 dalam satuan mg/mL. Metode solvotermal merupakan metode sintesis yang memanfaatkan reaksi pelarut di bawah tekanan dan suhu tinggi. Pengaruh konsentrasi dispersi solvotermal terbukti mempengaruhi struktur kristal, morfologi permukaan, dan gugus fungsi material rGO. Struktur kristal rGO telah terbentuk struktur *graphene few-layer* dengan ukuran kristal yang bervariasi yaitu berkisar 19,83 - 28,03 nm. Sampel SL-2 dengan konsentrasi dispersi 3 mg/mL pada hasil morfologi permukaan menunjukkan adanya pengelupasan menjadi lembaran atau helaian tipis *graphene* dan memiliki kandungan unsur karbon paling tinggi dengan kandungan unsur karbon sebesar 98,6 %, serta kandungan oksigen paling rendah dengan kandungan unsur oksigen sebesar 0,1 %. Selain itu, berdasarkan spektra FTIR sampel SL-2 memiliki intensitas serapan gugus fungsi C=C aromatic paling tinggi dengan intensitas sebesar 49,43%.

Kata kunci: rGO, dispersi, solvotermal, tempurung kelapa



ABSTRACT

Reduced graphene oxide (rGO) material is an interesting material to be developed because of its potential in various technologies. This research aims to make reduced graphene oxide (rGO) material based on coconut shell biomass using chemical-physical activation method using potassium hydroxide 90% by heating at 700 °C for 2 hours and modification of solvothermal method with variation of dispersion concentration 0, 1, 3, and 5 in mg/mL. Solvothermal method is a synthesis method that utilises solvent reaction under high pressure and temperature. The effect of solvothermal dispersion concentration was shown to affect the crystal structure, surface morphology, and functional groups of rGO material. The crystal structure rGO has formed a few-layer graphene structure with varying crystal sizes ranging from 19.83 - 28.03 nm. Sample SL-2 with a dispersion concentration of 3 mg/mL in the results of surface morphology shows the peeling into sheets or thin strands of graphene and has the highest carbon element content with a carbon element content of 98.6% and the lowest oxygen content with an oxygen element content of 0.1%. In addition, based on the FTIR spectra, the SL-2 sample has the highest intensity of C=C aromatic functional group absorption with an intensity of 49.43%.

Keywords: *Reduced graphene oxide (rGO), dispersion, solvothermal, coconut shell.*

